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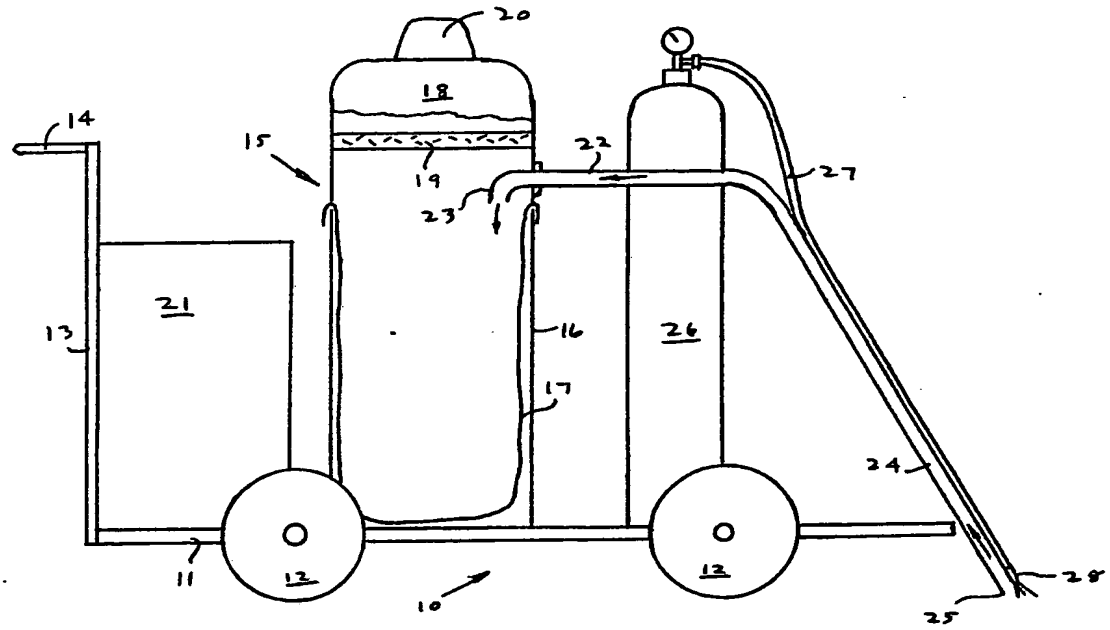
(54) Title: REFUSE COLLECTOR




(57) Abstract

The refuse collector includes a receiver (17) for the refuse, a vacuum cleaner unit (15) for collecting the refuse and transmitting it to the receiver (17), and a source of refrigerant gas (26), to be directed onto the refuse so as at least partly to freeze it before it is collected and transmitted to the receiver (17).

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# Refuse Collector

This invention relates to refuse collectors and is applicable particularly, but not exclusively, to a device for collecting dog excrement in a manner which is cleaner, healthier and less objectionable than currently used methods.

According to the invention there is provided a refuse collector, including a receiver for the refuse, means for collecting the refuse and transmitting it to the receiver, and a source of refrigerant gas, to be directed onto the refuse so as at least partly to freeze it before it is collected and transmitted to the receiver.

Preferably the means for collecting and transmitting the refuse comprises a vacuum cleaner unit and the source of refrigerant gas comprises a high pressure storage cylinder containing liquefied, or highly compressed, gas.

Conveniently, the refuse collector includes road wheels which may be power driven, for example, by storage batteries, which preferably also supply electrical power to the vacuum cleaner unit, or by an internal combustion engine, which can also generate and supply electrical power to the vacuum cleaner unit.

Preferred embodiments of the invention are described, by way of example only, with reference to the accompanying drawings which are side elevations of exemplary refuse collectors according to the invention.

Referring to Figure 1, a trolley 10 in the form of a platform or frame 11 runs on wheels 12 and has a rear wall 13 and handle 14.

The platform 11 has securely located thereon a vacuum cleaner unit 15 comprising an upright cylindrical body 16 in which a disposable refuse-receiving bag 17 is held, and a lid unit 18, fitting onto the location of the open end of the bag 17. The lid unit includes a transverse filter 19, through which air may freely pass but not particulate refuse, and a suction fan driven by an electric motor 20 and discharging through apertures in the lid unit 18.

The electric motor 20 of the vacuum cleaner unit 15 is powered by rechargeable electric batteries 21, mounted at the rear of the trolley 10. A large-bore suction pipe 22 has a rigid upper portion terminating within the vacuum cleaner body 16 in a downwardly discharging duct 23 over the bag 17. The rigid length of pipe 22 is connected by a flexible length 24 to a suction nozzle 25 which may be in the form of a scraper or blade, with which an operator can dislodge refuse from the ground, to be sucked by the vacuum cleaner unit 15, up the pipe 22 to fall into the bag 17 and be retained there until the bag 17 is later removed and destroyed. The flexible length of pipe 24 is clipped to the front of the trolley 10 with the nozzle 25 near to or bearing on the ground. Alternatively, it may be unclipped and manipulated as required by the operator to dislodge and, if necessary, break up quantities of refuse adherent to the ground.

Particularly for objectionable refuse, such as dog excrement, there is provided on the trolley 10 an upright high pressure cylinder 26 of innocuous compressed or liquefied gas or other suitable refrigerant. The gas is conducted by a pipe 27 (which is preferably insulated), clipped to the flexible pipe 24, to a discharge nozzle 28 discharging near to the suction nozzle 25.

Reference will now be made to Figure 2, in which like parts to those of Figure 1 are denoted by like reference numerals. In the embodiment of Figure 2, the electric motor

of the vacuum cleaner unit 15 is powered by an internal combustion engined generator 21a, mounted at the rear of the trolley 10, instead of batteries as described with refernce to the embodiment of Figure 1. A large-bore suction pipe 22a having a flexible upper portion 24a and a rigid end portion 24b is employed instead of a rigid upper portion and flexible end portion as described with reference to Figure 1.

The gas is conducted by insulated pipe 27 to a spray shroud 30 (via a control box 31), the flow of gas being controlled by a switch 32 on a handle 33, and also by a pressure controlled switch 34 on the shroud, the latter switch to be firmly pressed on to the ground to release the gas.

The rigid end portion 24b may be connected to the shroud, or as in the illustrated embodiment, disconnected therefrom such that it can be manipulated as required by the operator to dislodge and, if necessary, break up quantities of refuse adherent to the ground.

The trolley 10 further comprises an enclosed casing 35 having a hinged lid 36, for securely housing the high pressure cylinder, the batteries 21 (or internal combustion engine 21a) and the vacuum unit 15.

In addition to powering the electric motor 20, the batteries 21 (Figure 1) or the internal combustion engine 21a (Figure 2) may drive two or more of the wheels 12. For this purpose, controls are preferably provided on the handle 14. In addition, or alternatively, controls for the drive to the wheels 12, for the gas discharge and/or for the motor 20 may be provided on or adjacent the vacuum pipe 24, on or adjacent to the handle 33 of the spray shroud 30, and/or incorporated in the body of the casing 31.

By freezing the refuse, particularly excrement, thec latter may be detached from the ground and broken up, if necessary, and collected, without adhering to any of the apparatus (except the inside of the bag 17 when it thaws). Furthermore, freezing reduces obnoxious odours and tends to kill parasites and other organisms in the refuse.

CLAIMS:

1. A refuse collector comprising a receiver for the refuse, means for collecting the refuse and transmitting it to said receiver, and a source of refrigerant gas, to be directed onto the refuse so as at least partly to freeze said refuse before the latter is collected and transmitted to said receiver.

2. A refuse collector according to claim 1, wherein said means for collecting and transmitting the refuse comprises a vacuum pump unit.

3. A refuse collector according to claim 1 or 2, wherein said source of refrigerant gas includes a high pressure storage cylinder containing liquefied or highly compressed gas.

4. A refuse collector according to any of claims 1 to 3, which further includes road wheels.

5. A refuse collector according to claim 4, wherein said wheels are provided with power drive means

6. A refuse collector according to claim 5, wherein said power drive means comprises an electric motor.

7. A refuse collector according to claim 6, wherein said electric motor is driven by storage batteries or by a generator powered by an internal combustion engine.

8. A refuse collector according to claim 6 as appendant to claim 2, wherein said electric motor also supplies electrical power to said vacuum unit.

9. A refuse collector according to claim 1, substantially as described herein with reference to Figure 1 or Figure 2 of the accompanying drawings.

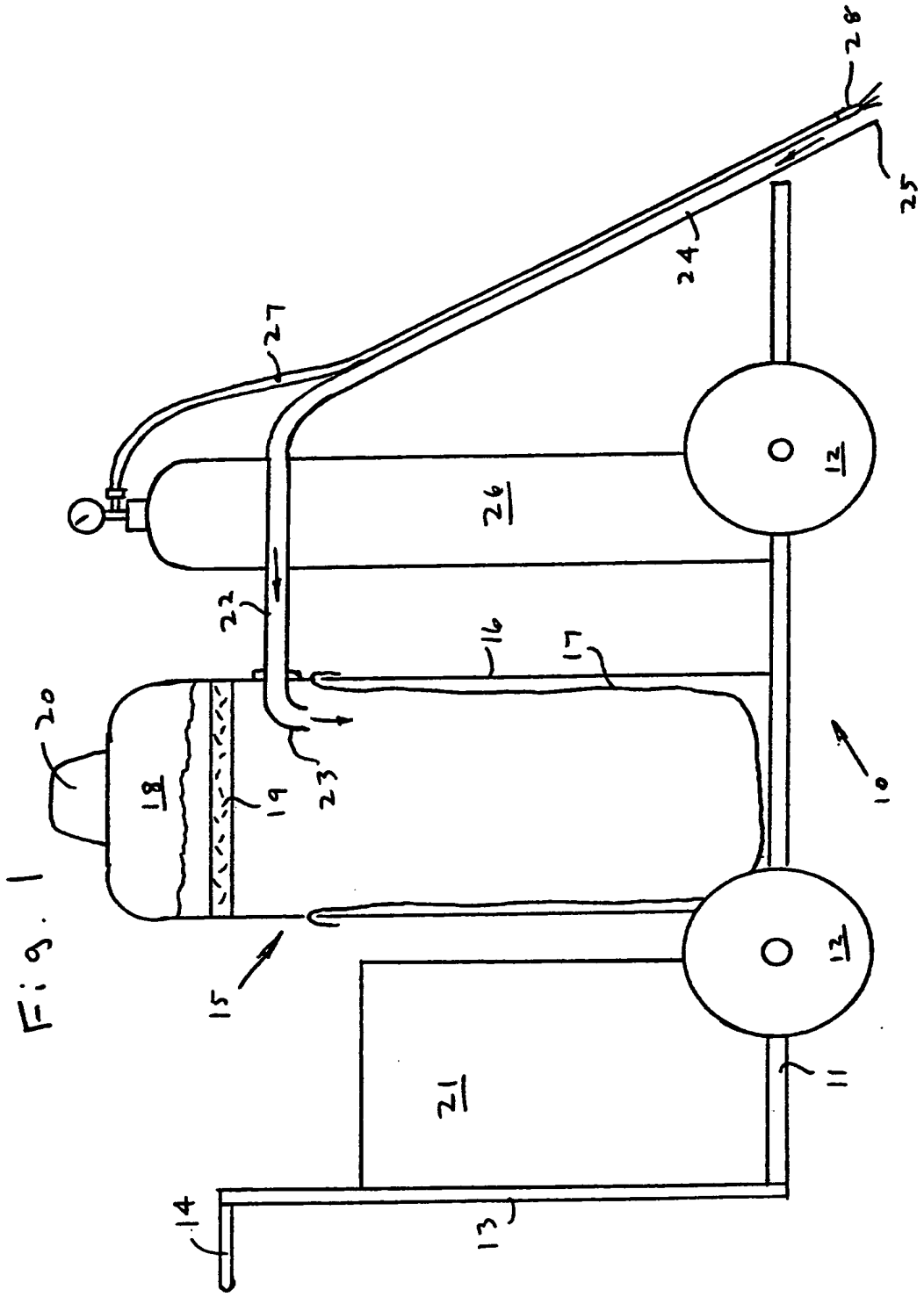
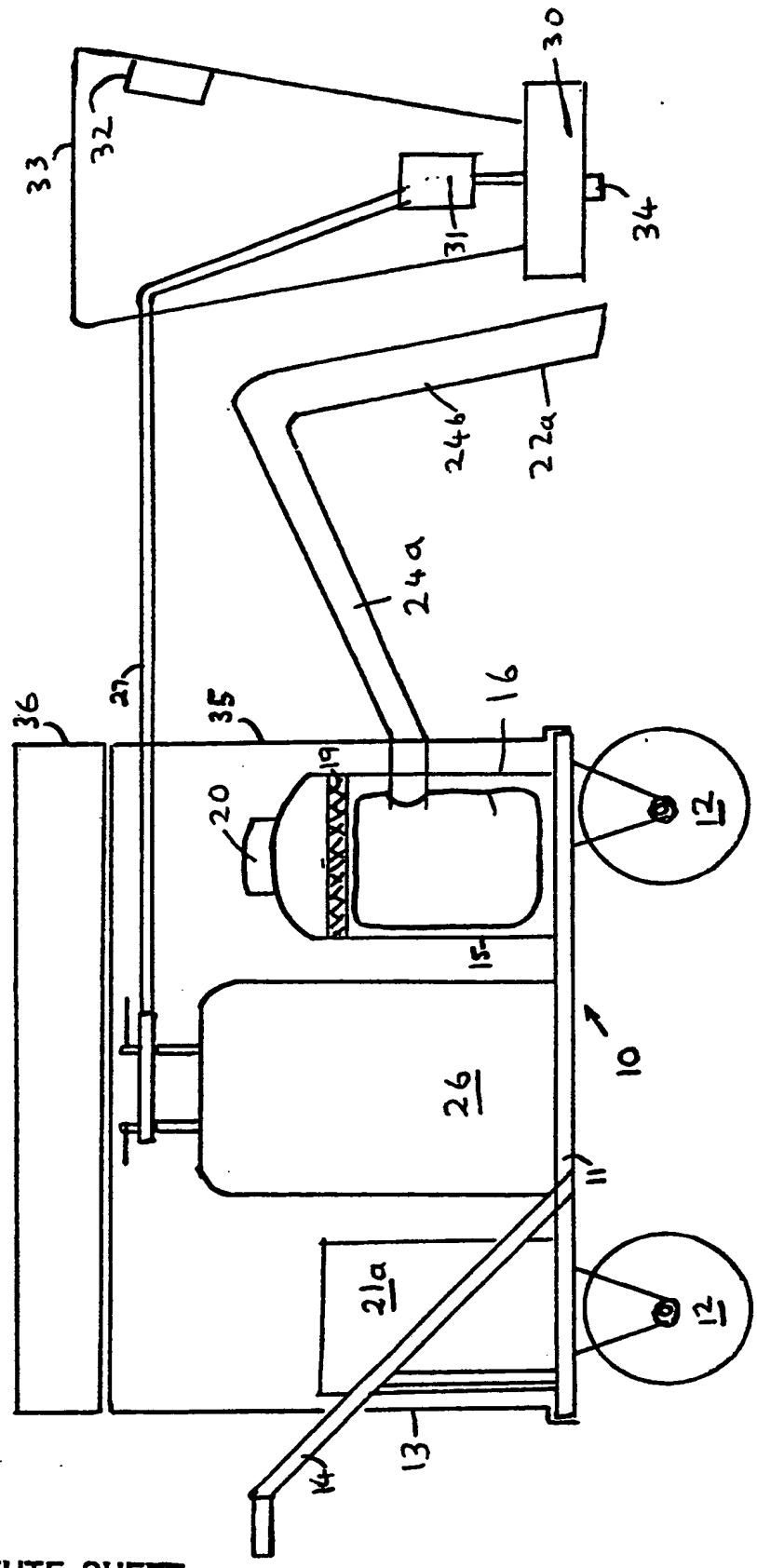



Fig. 1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24b
22a
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Fig.2

# INTERNATIONAL SEARCH REPORT

International Application No PCT/GB 89/00295

## I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [6]

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC[4]: E 01 H 1/08

## II. FIELDS SEARCHED

Minimum Documentation Searched [7]

| Classification System | Classification Symbols |
|---|---|
| IPC[4] | E 01 H |

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [8]

## III. DOCUMENTS CONSIDERED TO BE RELEVANT [9]

| Category [10] | Citation of Document, [11] with indication, where appropriate, of the relevant passages [12] | Relevant to Claim No. [13] |
|---|---|---|
| Y | DE, A, 3238062 (HOFFMANN) 19 April 1984, see the whole document | 1-7,9 |
| Y | FR, A, 2597130 (TROTTOIRNET) 16 October 1987, see the whole document | 1-7,9 |
| A | | 8 |
| Y | DE, A, 3606468 (BAUER) 3 September 1987, see the whole document | 1-5,9 |
| Y | EP, A, 0107602 (GROUPE SERVICES FR) 2 May 1984, see the whole document | 1-5,9 |
| Y | FR, A, 2533466 (L'AIR LIQUIDE) 30 March 1984, see the whole document | 1-3,9 |
| Y | FR, A, 2554841 (M. LE MAIRE DE GRENOBLE) 17 May 1985, see the whole document | 1-3,9 |

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## IV. CERTIFICATION

| Date of the Actual Completion of the International Search | Date of Mailing of this International Search Report |
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| 22nd June 1989 | 18. 07. 89 |
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# ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO. GB 8900295 SA 27766

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 07/07/89
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| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
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| DE-A- 3606468 | 03-09-87 | None | |
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| | | LU-A- 85015 | 24-04-84 |
| FR-A- 2533466 | 30-03-84 | None | |
| FR-A- 2554841 | 17-05-85 | None | |